AMERICAN ACADEMY *of* ACTUARIES

December 21, 2012

Commissioner Ted Nickel
Chair, Contingent Deferred Annuity (A) Working Group
National Association of Insurance Commissioners

Dear Commissioner Nickel,

The American Academy of Actuaries Contingent Annuity Work Group (CAWG) has prepared the attached report, "Actuarial Guideline XLIII (AG 43) for Contingent Deferred Annuities" in response to questions received from regulators regarding the use of AG 43 and C-3 Phase II (C3P2) as methodologies for establishing CDA reserves and risk-based capital requirements.

The attached report finds that AG 43 provides an appropriate methodology for establishing CDA reserves. There is similar reasoning for following C3P2 for CDA risk-based capital (RBC) requirements and is therefore RBC is not specifically addressed in this document. The CAWG has not been involved in any modeling that would illustrate the reserve and capital requirements that would emerge for CDAs under AG 43/C3P2, as we do not believe that such modeling is needed to illustrate that AG43/C3P2 are appropriate methodologies. However, the document does provide discussion of the key modeling considerations and the major components of the AG 43 reserve calculation, which is intended to address regulatory questions regarding the implications of the unique aspects of the CDA product design on required reserves.

We hope this document is helpful, but we also see it as the starting point for further dialogue with regulators on this subject. We would be happy to set up some time to discuss this document with the appropriate NAIC groups.

If you have any questions, please feel free to contact us.

Sincerely,

Andy Ferris, Chair
Contingent Annuity Work Group
American Academy of Actuaries

Cande Olsen, Chair
Life Practice Council
American Academy of Actuaries

Members of the Contingent Annuity Work Group:

Noel Abkemeier FSA, MAAA,
Nancy Bennett, CERA, FSA, MAAA,
Peter Bondy, FSA, MAAA,
Christian DesRochers, FSA, MAAA,
David Hippen, FSA, MAAA,
Barbara Lautzenheiser FCA, FSA, MAAA

Kenneth Mungan, FSA, MAAA,
Timothy Pfeifer, FSA, MAAA,
Kevin Reopel, FSA, MAAA,
Linda Rodway, FSA, MAAA,
Steven Thiel, FSA, MAAA,
James Thompson, FSA, MAAA

We would also like to thank the following subject matter experts for their assistance with our analysis:

Elizabeth Dietrich CERA, FSA, MAAA,
Michael Kaufman, FSA, MAAA,

Actuarial Guideline XLIII for Contingent Deferred Annuities

Table of Contents

Actuarial Guideline XLIII for Contingent Deferred Annuities

APPLICABILITY

The statutory reserve guidance for Contingent Deferred Annuities (CDAs) is provided by Actuarial Guideline XLIII (AG 43). The scope of AG 43 includes variable annuities with or without guaranteed minimum death benefits (GMDBs) and living benefits (VAGLBs), as well as "products that contain guarantees similar in nature to GMDBs or VAGLBs, even if the insurer does not offer the mutual funds or variable funds to which these guarantees relate, where there is no other explicit reserve requirement." AG 43 was designed to be flexible and applicable to many product variations, both existing and anticipated. This flexibility is enabled by its design as a primarily principle-based framework, wherein actuarial principles and stochastic methodologies, rather than rigid static approaches, are prescribed. It should be noted that AG 43 is not a "pure" principle-based standard, as it contains some prescribed requirements such as the Standard Scenario. Acknowledging that there might be concern by some that certain prescribed elements may need to be reviewed in greater detail to confirm that they appropriately fit CDAs, the comments in this memo relate to AG 43 being applied to CDAs in a manner consistent with similar guarantees provided by variable annuity guaranteed living benefits. Based on this review, the CAWG finds no material shortcomings in AG 43 prescribed elements as they would apply to CDAs.

REQUIREMENTS

Under AG 43 the insurer is required to set reserves based on the projected future cash flows for the whole contract, including utilization of benefit options, over:

> ➤ A wide range of economic scenarios at each valuation date, which take into account both the assets associated with contractholder funds and those backing the guaranteed benefits held in the insurer's General Account, based on Prudent Estimate assumptions (the "Conditional Tail Expectation Amount" but referred to herein as the "Stochastic Reserve" to be consistent with the terminology generally used today for Principle-Based Reserves); and

> ➤ A single scenario of prescribed conservative assumptions, providing for a minimum level of reserves that are held to support the liability regardless of the Stochastic Reserve amount ("Standard Scenario Amount").

The reserve held is the greater of the Stochastic Reserve and the Standard Scenario Amount described above. Detailed discussion of the reserve calculation is provided in subsequent sections of this document.

KEY PRINCIPLES

The methodologies prescribed by the Stochastic Reserve component of AG 43 reflect principles of asset adequacy analysis and are appropriate for recognizing the mortality and/or longevity guarantees, other

guaranteed benefits, and the variable nature of the benefits provided by the products. Key principles which are reflected in AG 43 are:

➢ **Stochastic analysis and fat tail risk assessment**

During the development of AG 43, it was recognized that many life and annuity products cover risks which are considered to be low frequency - high impact events. When one considers the expected distribution of these outcomes, it is possible that the distribution of the financial effects of these types of risks will have "fat tails", meaning that the portion of the distribution above a relatively high percentile (85% or so, when results are ranked from the lowest to highest) is large in comparison with other distributions such as the Normal Distribution. The stochastic analysis used to determine the Stochastic Reserve component of AG 43 is an analysis methodology that can assess fat tail risks because it involves projection of financial results over a large number of scenarios which trigger the risk(s) representing a wide range of possible outcomes for one or more random variables. Given the variable nature of the cash flows and guaranteed benefits associated with the products within its scope, AG 43 requires projection over a large number of capital market and interest rate scenarios to ensure that a wide range of potential outcomes is represented. This is an appropriate analytical approach for guarantees which incorporate fat tail risks.

Thus, given the intent of reserve requirements and the nature of the risks associated with the guarantees falling within the scope of AG 43, a greater focus is given to the tail of the distribution in the Stochastic Reserve calculation. This is demonstrated by the capital market scenario calibration criteria, which focus on the tails of the scenario distribution, and the Conditional Tail Expectation (CTE) measure required by AG 43. The scenario calibration criteria specify the minimum and maximum wealth accumulation values for various quantiles of the scenario set. (The wealth accumulation factor is a measure of a scenario's positive or negative returns and is just the accumulation of a $1.00 starting value using the scenario returns.) The calibration criteria ensure that the scenarios do not overstate upside potential nor understate downside equity market risk. The CTE measure is a statistical metric for capturing tail risk. CTE(x) is equal to the average of results from the (100-x)% tail of the distribution of financial results. By taking the average of the worst 100-x% of results, the CTE measure provides enhanced information on the tail in comparison to that provided by an average or percentile value. AG 43 requires the use of CTE 70, or the average of the worst 30% of scenario results, for determining the Stochastic Reserve.

➢ **Prudent Estimate assumptions**

According to AG 43, assumptions used in the stochastic projections are to be the actuary's Prudent Estimate, meaning that "they are to be set at the conservative end of the actuary's confidence interval as to the true underlying probabilities for the parameter(s) in question, based on the availability of relevant experience and its degree of credibility." Prudent Estimate assumptions are based on "Anticipated Experience," or the actuary's reasonable estimate of future experience for a risk factor given all available, relevant information pertaining to the

contingencies being estimated, plus a margin to adjust the Anticipated Experience assumption to reflect the conservative end of the actuary's confidence interval. Appendices 9 and 10 of AG 43 provide detailed guidance on setting assumptions in accordance with Prudent Estimate principles for Contractholder Behavior and Mortality, respectively. According to AG 43, assumptions should be based on actual experience data directly applicable to the business segment (i.e., direct data) if it is available. An important consideration with respect to products falling within the scope of AG 43 is limited experience: due to new product development there may be little or no credible experience directly related to a product for the first few years after a product is issued. In the absence of direct data, AG 43 directs the company to look to use data from a segment that is similar to the business segment being valued, whether or not the similar segment is directly written by the company. AG 43 requires that margins reflect the data uncertainty present when using data from a similar but not identical business segment and include any necessary adjustments for data quality, as well as margins to shift the assumption to the conservative end of the plausible range of expected experience.

One important aspect of the conservatism built into the mortality assumption requirements is that the actuary must identify portions of the business for which the reserve increases if mortality margins are positive (e.g., those dominated by the cost of death benefit guarantees), called "positive segments" and those for which the reserve increases if the margin is negative (e.g., those dominated by living benefit guarantees), called "negative segments". Thus, margins must produce higher reserves rather than lower reserves.

Sensitivity testing of assumptions is required under AG 43. The results of sensitivity tests are used to inform the assumption-setting process. AG 43 requires that the actuary apply more caution in setting assumptions for behaviors where testing suggests that stochastic modeling results are sensitive to small changes in such assumptions. For such sensitive behaviors, the actuary uses higher margins when the underlying experience is less than fully relevant and credible. AG 43 provides that sensitivity testing should be more complex than, for example, a base lapse assumption minus 1% across all contracts. Instead, sensitivity testing should reflect the dynamics of the product and resulting contractholder behavior in light of product complexity and optionality.

➢ **Modeling of cash flows**

The calculation of the Conditional Tail Expectation Amount is based on analysis of asset and liability cash flows produced by the application of a stochastic cash flow model to equity return and interest rate scenarios. The methodology utilizes a projected statutory balance sheet approach by including all projected income, benefit and expense items related to the business in the model. All cash flows for the entire contract (unless other guidance applies to the underlying contract) are included in the stochastic reserve. AG 43 requires that reserve determination be performed in aggregate across all contracts, subject to limitations related to contractual provisions, such as reinsurance treaties, to allow for natural offset of risks within a given scenario. Thus, reserve levels will reflect any offsetting risks, or lack thereof, contained in the contract.

AG 43 provides guidance on modeling approaches and methodologies, including:

- Grouping of variable funds and subaccounts
- Grouping of contracts and allocation of aggregate reserves to the contract level
- Modeling of hedges
- Revenue sharing
- Length of projections
- Asset Valuation Reserve/Interest Maintenance Reserve (AVR / IMR)
- Determination of scenario Greatest Present Value amounts
- Projection scenarios – minimum required scenarios and calibration criteria
- Projection assets – Separate Account (contractholder funds) and General Account

AG 43 also provides guidance on model validation, and requires documentation of the model validation process in the supporting Memorandum.

By providing guidance on the appropriate principles and methodologies for the actuary to apply rather than prescribing strict assumptions about specific product designs, customer behaviors, and other factors, AG 43 meets an important goal of any principle-based approach: to be able to apply appropriate techniques to a variety of products so that new actuarial guidelines would not need to be written every time a new product is introduced as had been done over the previous decade with AG 33, AG 34, AG 35 and AG 39. This is especially useful for products in the variable annuity / CDA space, in which product design variation and innovation occurs frequently but the fundamental purpose and risks of the products remain generally constant. Thus, applying AG 43 to CDA annuities not only is provided for under the wording of AG 43, but achieves an important goal of PBA - applying established principles to the determination of reserves for products that were not in existence at the time AG 43 was drafted.

APPLYING AG 43 TO CDAs

> **Setting Prudent Estimate assumptions for CDAs where little or no direct experience is available**

Under AG 43, lack of experience requires reference to the experience of similar business segments, for instance, Variable Annuities with Guaranteed Lifetime Withdrawal Benefits (GLWBs), and the use of adjustments and margins to reflect differences between the segments and uncertainty, and to place the assumption at the conservative end of the expected experience range.[1] Thus, it may be appropriate to use assumptions that apply to VAs with GLWBs to the extent the GLWB being used is similar to the CDAs being valued, and to the extent any appropriate modifications to reflect differences in product design, distribution channel / method, and contractholder characteristics or target market are made. Additionally, higher margins would be applied in developing CDA assumptions as compared to GLWB assumptions for an insurer who has written GLWB business long enough to develop experience, to reflect the lack of direct, relevant experience and potentially higher levels of uncertainty in the assumption. Appendix 9 of

---

[1] Actuarial Guideline XLIII, Appendices 9 and 10

AG 43 also provides guidance where relevant and fully credible empirical data do not exist for a given contractholder behavior assumption. Key assumptions for CDAs include:

- Mortality
- Lapse and dynamic lapse
- Withdrawal benefit utilization
- Asset allocation decisions
- Ongoing "contributions" and annuitization, if applicable

> **Modeling CDA covered assets**

CDA covered assets can be modeled according to AG 43 in the same way that variable annuity Separate Account assets are. However, for variable annuities, these assets are projected both for the determination of future contractholder benefits and to project the value of Separate Account assets backing the Separate Account reserve liability, whereas for a CDA, they are projected only to determine future benefits. (In both cases, a General Account reserve is held for the insurer's liability associated with the future benefits payable once contractholder assets are exhausted.) Under AG 43, CDA covered assets and variable annuity Separate Account assets must be mapped to representative indices and asset classes[2] ("proxy funds"), for instance to the 19 different asset classes specified in AG 43. The actuary is responsible for determining the appropriate mapping of actual contractholder funds to the proxy funds, taking into consideration expected returns and volatilities of the funds, correlations, and diversification benefits, and for performing the mapping. The actuary must document the development of the investment return scenarios and be able to justify the mapping of the company's variable accounts to the proxy funds used in the modeling.[2] The fund return scenarios must meet calibration requirements as specified by the Guideline. Appendix 5 of AG 43 provides guidance on the asset mapping process and specifies the calibration requirements for the stochastic scenarios.

Fund investment management fees would reflect actual levels for the contractholder covered assets. Revenue sharing would be reflected only if explicitly part of the contractual agreement between the insurance company and the asset management firm. AG 43 places other restrictions on the amount of revenue sharing that may be reflected in the reserve projections. The amount of Net Revenue Sharing included in the projections would follow the guidance provided in Appendix 1 of AG 43.

Note that AG 43 makes reference to "Separate Account" assets when describing the requirements for projecting variable funds. While CDA covered assets are not held in the Separate Account, the same principles would apply when modeling these assets in terms of asset mapping and grouping, scenario calibration, and the reflection of investment fees and expenses. Like variable annuity Separate Account assets, CDA covered assets are modeled in order to project the cash flows which drive the scenario Accumulated Deficiencies and the Standard Scenario Reserve.

---

[2] Actuarial Guideline XLIII, Appendix 5

➢ **Does AG 43 consider risks associated with externally held assets?**

There has been some regulatory concern that CDAs may be designed to protect individual stock accounts, rather than the more diverse funds that variable annuities would be limited to by the diversification requirements of the 1940 Investment Company Act. Such a situation is unlikely given the markets for these products (mutual funds, managed accounts, retirement plan assets, etc.) and insurance company risk tolerance as demonstrated by industry practice such as required diversification and asset allocation, volatility restrictions, and other requirements which limit market risk well beyond the diversification requirements of the 1940 Act. However, if a company were to design a CDA that would be available with individual stocks or other assets significantly different than those available for variable annuities with GLWBs, the AG 43 requirements for asset mapping and scenario calibration would ensure that reserves reflected such a situation. As previously mentioned, the actuary must certify that the proxy investment vehicles recognized in the reserving are appropriately representative of the actual investments. This is described in Appendix 5 of AG 43.

There has also been some regulatory concern that AG 43 may not address certain issues associated with outside ownership of assets. Issuers of CDAs typically impose the same types of restrictions on available funds and required allocations as for variable annuities with GLWBs. While VA contracts with GLWBs address this through methods such as restricting funds and allocations through the construction of subaccounts and specification of allocation requirements in the annuity contract, CDAs typically address this through the limitation of available funds and required / limited asset allocations permitted by the CDA contract. Under VA contracts with GLWBs, fund manager adherence to stated investment policy can be enforced by eliminating funds from a Separate Account, when necessary. Under a CDA, the same result typically is achieved through enforcement of either contractual terms in a group CDA or a separate agreement with the asset management firm. This is a form of operational risk for the company, not a financial risk associated with the insurance guarantee provided to contractholders. As such, the risk is not explicitly reflected in the reserve calculation, nor is it intended to be, just as other business and operational risks are not explicitly reflected. In general there are no specific components of statutory reserve calculations to account for operational risks for any product, not just CDAs. Operational risk is managed through operational controls, legal protections, insurer capital, and other methods. Like any business agreement, the proper legal contracts would need to be in place for CDAs so that the insurer could rely on the asset manager to manage the assets in a manner consistent with the stated investment policies and the insurer's risk tolerance criteria, as well as to ensure that the requisite data sharing takes place for all business processing. Note that the asset management firm has fiduciary responsibilities and other regulatory requirements to comply with and so also has an interest and duty to manage the assets according to stated criteria. Further it should be noted that variable annuity Separate Accounts include both internally managed and externally managed funds, and thus there are insurers who have experience in providing guarantees related to assets administered on both insurer-owned and third party-owned platforms. As typical practice with any new product, insurers wishing to issue CDAs would generally look to existing experience and expertise where it is available (which may be through consultants or similar lines of business if the insurer does not have direct experience to rely upon. Existing experience does not remove exposure to operational risk, and it is important for

regulators to work with the CDA issuer to understand how operational risk associated with external assets is addressed through the various risk protections and controls available to the insurer. While operational risk controls are an important consideration for CDAs, AG 43 is not the place where this risk is or should be addressed.

RESERVE CALCULATION – Comparison between a Variable Annuity with a GLWB and a CDA

AG 43 determines reserves as the greater of the Stochastic Reserve and reserves determined under a Standard Scenario. Both bases will be analyzed and some other considerations will be commented upon. Note that this comparison is for educational purposes with respect to the key differences that may arise between a variable annuity with a GLWB and CDA when calculating reserves according to AG 43. It does not intend to prove that AG 43 produces adequate reserves for either product.

Stochastic Reserve

For the cash flow projections used to determine the Stochastic Reserve, AG 43 states that Starting Assets are equal to "the sum of the following items, all as of the start of the projection:

1. All of the Separate Account assets supporting the contracts
2. An amount of assets held in the General Account equal to the approximate value of statutory reserves as of the start of the projections, less the amount in 1), above."

The Guideline requires that the actuary document which assets were used as of the start of the projection and the approach used to determine which assets were chosen, as well as provide verification that the value of the assets equals the approximate value of statutory reserves at the start of the projection. For a CDA, item 1, above, is zero since the insurer does not own those assets. Though not a specific requirement of AG 43 (as AG 43 does not provide explicit guidance for cases in which the insurer does not own the assets), we believe that this is a reasonable interpretation of the guidance.

The application of the stochastic methodology to generate cash flow projections for VA contracts with GLWBs and CDAs can be profiled as follows:

Stochastic Reserve Calculation under Actuarial Guideline XLIII	
VA contract with GLWB*	**CDA**
Working Reserve is VA cash value	Working Reserve is zero**

Project:
   − Revenues (Mortality and Expense Risk (M&E), Expense Charges, Net Revenue Sharing Income, GLWB Charges),
 	
   − Expenses,
 	
   − Benefits (Death, Surrender, Withdrawal, and GLWB),
 	
   − Changes in the VA Working Reserve, and
 	
   − Investment Earnings/Losses
	Project:
	   − Revenues (CDA Charges),
	
	   − Expenses,
	
	   − Benefits (GLWB), and
	
	   − Investment Earnings/Losses

Determine Greatest Present Value of Accumulated Deficiencies (GPVAD) for each scenario and add to the Starting Assets to determine the Scenario Greatest Present Value	Determine GPVAD for each scenario and add to the Starting Assets to determine the Scenario Greatest Present Value
Calculate CTE 70 of the Scenario Greatest Present Values as reserve	Calculate CTE 70 of the Scenario Greatest Present Values as reserve

*Assumes a VA contract with GLWB only, no other optional benefits (e.g., GMDB)
**Since for a CDA, the insurer does not own the assets and there is no cash value, a reasonable interpretation of AG 43 is that the Working Reserve is zero.

The observations listed below are intended to provide education through insights into the mechanics of AG 43's Stochastic Reserve calculation for a CDA relative to a variable annuity with a GLWB and are not meant to be definitive statements describing AG 43 reserves universally for CDAs. The analysis is based on some assumptions which may not be realistic but have been made to facilitate a more direct comparison of a CDA and GLWB, by isolating the reserve impact of the insurer not owning the assets.

The analysis assumes a CDA structure which provides identical benefits to the GLWB and for which the product fee is identical to the GLWB rider fee. It further assumes that there are no additional customer charges for the CDA contract and no revenue sharing agreement between the insurance company and asset management firm associated with the CDA. It also assumes identical net rates of return, contractholder mortality and behavior between the CDA and the variable annuity with a GLWB.

These simplifying assumptions are useful for the analysis as they allow for a more straightforward comparison of reserves between a CDA and a VA with a GLWB by isolating the major differences between the two products; however, it is unlikely that in actual practice a CDA would be designed to provide identical benefits to a GLWB with a single fee exactly equal to the GLWB rider fee. This is because there are other costs and margins which would need to be provided for in the CDA pricing beyond those covered by a typical variable annuity GLWB rider fee, such as expenses associated with issuing and administering the business, risk margins and profit. Since there are no other sources of revenue available to the insurer, the CDA fee likely have to be higher, or benefits would have to be reduced (all other things being equal) in order to ensure coverage of these items in addition to coverage of the guarantee cost. Also, as discussed in preceding sections, various CDA product and business model structures are possible that would result in differences between CDAs and VAs with a GLWB covered assets, guaranteed benefits, expenses, mortality, contractholder behavior, etc. These differences would be reflected in the models and assumptions for AG 43 as discussed, and could impact CDA reserves positively or negatively relative to VA with GLWB reserves.

Based on the aforementioned assumptions, and the interpretations of the guidance outlined in the chart above, the major differences in the application to VA contracts with GLWBs and CDAs are:

➢ The investment earnings and losses on the assets backing the contractholder account value for VA contracts with GLWBs are included in the reserve calculation, but are offset by the change in the VA Working Reserve. However, neither component (investment earnings/losses and the offsetting change in VA Working Reserve) is recognized in the Stochastic Reserve calculation with CDAs. The projection of these contractholder assets in the calculation for CDAs is external to the reserve calculation and, as noted, is used only to determine potential guaranteed benefits. This is because with CDAs, the insurer does not own the assets and so does not hold reserves backing contractholder account values. (The insurer holds a General Account reserve only for guaranteed benefits provided by the CDA.)

➢ Projected revenues in the Stochastic Reserve calculation for VA with GLWB exceed those projected revenues in the calculation for CDAs by amounts covered by items such as M&E and Expense Charges, and Net Revenue Sharing Income; however, this excess must cover Death, Surrender, and Withdrawal benefits, trail commissions and expenses, and the amortization of surrender charges (through the change in the VA Working Reserve).

➢ Of particular interest are the M&E and Expense Charges, and the Net Revenue Sharing Income, which are available to cover the reduction of the surrender charge over time (through the change in the VA Working Reserve) and other benefits for the underlying VA. To the extent that these revenue items net to a positive amount (and again based on the assumption that the CDA charge is equal to the GLWB charge), this net VA revenue plus the GLWB Charge will exceed the CDA net revenue for comparable benefits in the stochastic reserve projection.

➢ Comparing the CDA to the VA with GLWB, lower net revenues for identical benefits would result in higher deficiencies in the stochastic reserve projection, all else equal.

In actual practice, there are a number of factors which impact projected deficiencies, including benefit features, fees, characteristics of the underlying funds, and assumptions. These items will likely differ between a VA with a GLWB and a CDA, thus deficiencies projected in the stochastic reserve calculation could be higher or lower than those of a VA with a GLWB.

Standard Scenario

The Standard Scenario requirements are described in Appendix 3 of AG 43. The Standard Scenario in AG 43 has various components, with a Basic Adjusted Reserve determined for benefits other than guaranteed benefits, a "CARVM-like" portion and another component called the Accumulated Net Revenue for the living and death benefits equal to the excess of projected benefits over projected revenues.

The differentiation between revenue for a VA contract with a GLWB and a CDA is characterized as follows:

Revenues Recognized in the Standard Scenario of Actuarial Guideline XLIII	
VA contract with GLWB	**CDA**
During Surrender Charge Period:	
(i) .20% of Account Value, plus	(i) None
(ii) Net Revenue Sharing Income, plus	(ii) None
(iii) Greater of .20% of Account Value or Explicit GLWB Charge, plus	(iii) CDA Charge
(iv) Greater of .20% of Account Value or Explicit GMDB Charge (consider inapplicable)	(iv) Inapplicable
After Surrender Charge Period:	
Sum of (i), (ii), (iii), and (iv) above plus	CDA Charge
50% of the excess of M&E and Expense Charges over (i), (iii), and (iv)	

While AG 43 does not explicitly state the requirements for calculating the Standard Scenario reserve for a CDA as outlined above, this is a reasonable interpretation of the Standard Scenario calculation given the standalone nature of the CDA guarantee.

Based on the aforementioned assumptions, and the interpretations of the guidance outlined in the chart above, the major differences in the application to VA contracts with GLWBs and CDAs are:

➢ Broadly speaking, under the Standard Scenario VA with GLWB reserves give recognition to sources of revenue on the underlying variable annuity, such as M&E and Expense charges and Net Revenue Sharing Income, while the CDA does not have these revenue sources. In actuality this may be partially offset to the extent the CDA charges are larger than the GLWB charges, but for purposes of this comparison we are assuming the CDA charge is identical to the GLWB charge.

➢ During the surrender charge period, variable annuity with GLWB revenues would generally exceed CDA revenues. Since the recognized VA with GLWB revenues after the surrender charge period are increased, the excess of VA with GLWB revenues over the CDA revenues would be even greater during that period.

> ➢ Comparing the CDA to the VA with GLWB, lower net revenues for identical benefits would result in higher deficiencies in the Standard Scenario projection, all else equal.

ACTUARIAL CERTIFICATION AND SUPPORTING MEMORANDUM

Appendix 8 of AG 43 specifies the Certification Requirements under AG 43. Certification must be provided by a qualified actuary that the calculations have been performed in accordance with AG 43, that the assumptions used to determine the stochastic reserve are Prudent Estimate assumptions, and that all work was performed in accordance with all applicable Actuarial Standards of Practice (ASOPs). The supporting Memorandum must contain documentation on the assumptions used, including a summary of the assumption values, the source of the experience data backing them, the assumption development process, and results of assumption sensitivity testing. Additionally, the supporting Memorandum provides detailed information including:

- – Description of the products tested
- – Whether / how reinsurance and hedging impact results
- – Model validation process and results of validation testing
- – Any material changes in models or assumptions from prior year
- – Documentation of specific items pertaining to the Standard Scenario calculation

By nature, a principle-based framework is flexible to allow for application of the techniques to various guarantee designs with relevant assumptions. This introduces the potential for some level of subjectivity, and as such it is important that all methodologies and assumptions used are clearly documented and described in the supporting communications, and that all ASOPs are adhered to and that adherence is clearly demonstrated.

SUMMARY

In summary the CAWG finds that:

- ➢ AG 43, according to its stated scope, is applicable to CDAs.

- ➢ AG 43 is an appropriate framework for reflecting the risks present in CDAs, because it uses sound actuarial principles and financial modeling techniques.

- ➢ AG 43 is an appropriate framework for determining reserves for CDAs, by way of its design as a principle-based framework.

- ➢ We find no material shortcomings in AG 43 prescribed elements as they would apply to CDAs.

Of course, as with any methodology, the assumptions chosen by the actuary as part of his/her professional responsibility are a key component in establishing reserves. AG 43 is an appropriate framework in that it can be used to reflect risks and to determine reserves for CDAs, but only if appropriate assumptions and techniques are used. The statement that AG 43 is an appropriate

framework should not be considered an assertion that AG 43 will produce adequate reserves in all cases.

AG 43 provides for company management and actuarial certification, adherence to Actuarial Standards of Practice, and substantial documentation of all aspects of the reserve calculation in the Certification and Memorandum to the regulator.

With any new product, it is important to monitor emerging experience to ensure that the reserve requirements applicable to the product have the intended effects. With CDAs, it will be important to monitor reserves, as well as the elements of a company's CDA reserve calculation including assumptions and methodologies, for inforce contracts.